

A NEW SPECIES OF *DIPORIPHORA* FROM SOUTH AUSTRALIA AND GEOGRAPHIC VARIATION IN *D. WINNECKEI* LUCAS & FROST (LACERTILIA: AGAMIDAE)

by TERRY F. HOUSTON*

Summary

HOUSTON, T. F. (1977) A new species of *Diporiphora* from South Australia and geographic variation in *D. winneckeii* Lucas & Frost (Lacertilia: Agamidae). *Trans. R. Soc. S. Aust.* 101(8), 199-205, 30 November, 1977.

A new species of dragon lizard, *Diporiphora linga*, is described from western South Australia. It is closely related to *D. winneckeii* and, in order to facilitate comparison, the geographic variation of *winneckeii* is briefly reviewed with the recognition of two distinct races. Notes on the habitats of the two species are included.

Introduction

Specimens of an undescribed species of *Diporiphora* Gray were first collected in 1921 at Immarna, S.A., on the Transcontinental Rail Line and were identified as *D. australis* (Steindachner) by Kinghorn (1924). These specimens were apparently the basis of Cogger's (1975) record of *D. reginae* Glauert from western S.A. Storr (1974) referred other specimens of the species to *D. winneckeii*.

My recognition of the new species followed extensive field studies when many live specimens were examined, from a study of specimens of *D. reginae*, most of the 'winneckeii' listed by Storr (1974) and additional material in the Australian and South Australian Museums. These studies also revealed that *winneckeii* comprises at least two geographic races and these are briefly defined in order to allow comparison with the new species.

The following abbreviations of the names of institutions or collections are used:

- AEG Allen E. Greer collection (presently in AM)
- AM Australian Museum, Sydney
- SAM South Australian Museum, Adelaide
- WAM Western Australian Museum, Perth

Diporiphora winneckeii Lucas & Frost

FIGS 1-5

TYPICAL EASTERN RACE

Diporiphora winneckeii was described from Charlotte Waters, Northern Territory, a locality near the S.A. border on the western fringe of

the Simpson Desert. All specimens examined by me from the Lake Eyre and Lake Torrens Basins (i.e. east of broken line A, Fig. 1) agree with the descriptions and figure of Lucas & Frost (1895, 1896) and represent a discrete race.

Features distinguishing this race from western populations are: no pre-anal pores in either sex; gular area with three bold longitudinal stripes, the median stripe continuous with a pair of stripes extending down the chest and belly (Fig. 2), the stripes grey in males and either yellow or grey and yellow in females; head with dark dorsal markings (Fig. 3).

Variation is slight. The lizards all appear extremely slender, almost emaciated. The gular fold is weakly developed and sometimes absent medially.

At each of several localities where I collected specimens the lizards were on sand ridges in or near bushes of Sandhill Canegrass (*Zygochloa paradoxa*). This leafless plant has wiry tangled stems and grows in hummocks almost exclusively on sand ridges. Its range includes the Simpson Desert and bordering areas, and extends south to Port Augusta and east to the Darling River, New South Wales. Thus the known distribution of typical *winneckeii* corresponds approximately to the range of the canegrass.

WESTERN POPULATIONS

Specimens of *winneckeii* from western N.T. and the Northwest and Eastern Divisions of

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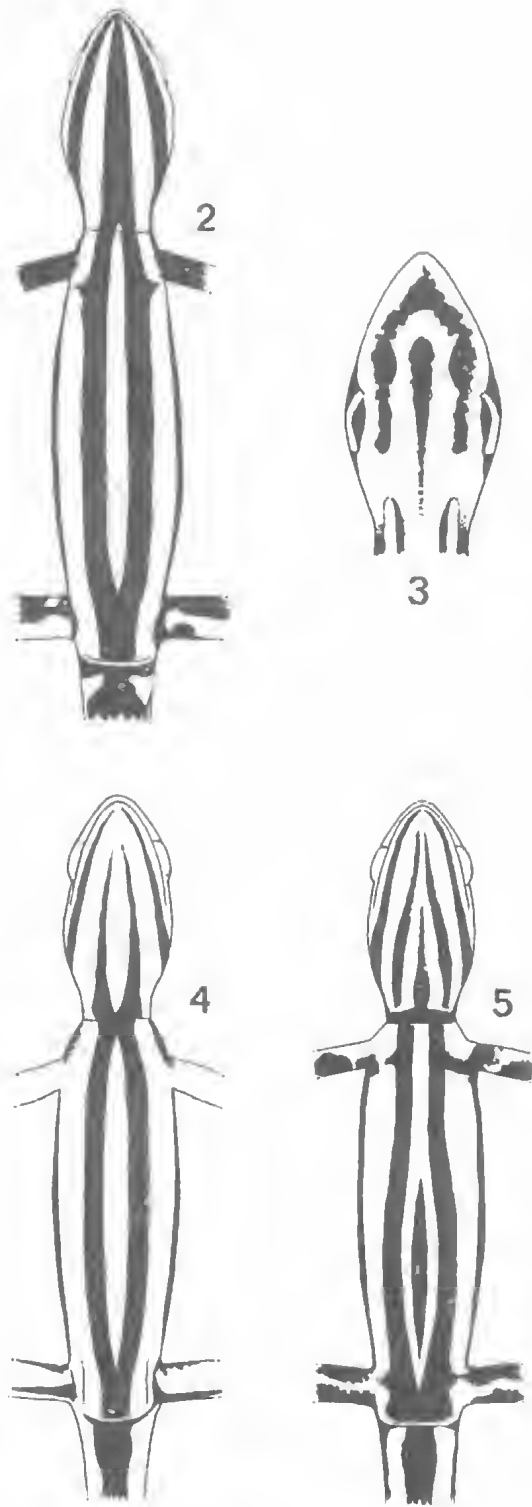


Fig. 1. Known distribution of *Diporiphora linga*, *D. winneckeii* and some specimens of doubtful identity. Solid symbols = specimens examined, open circles = literature records. See text for further explanation.

Western Australia (see Fig. 1) differ from those of the typical race as follows: 1–2 pairs of pre-anal pores in both sexes (though weak—rarely absent—in females); gular area with 4–5 narrow longitudinal grey stripes (Figs 4, 5).

These western *winneckeii* are far more variable than the eastern race and, as I have only examined preserved material, I have preferred not to formally establish a new race at this time.

While the majority of specimens have the same extremely attenuated form of the typical race, some are outstanding in being more robust with thicker necks and larger heads. To quantify robustness in preserved, often distorted specimens is very difficult, but the ratio of head width to head length provides an approximation. It was found that the frequency distribution of this ratio was normal, so that the robust and very slender specimens connect



through an unbroken series of intermediates, the latter forming the bulk of the population. Additionally, the unusually robust specimens come from widely scattered localities on the Pilbara coastal plain, the Hamersley Plateau and the eastern desert of W.A.

The gular fold is also subject to variation, being strongly developed in the majority of specimens but occasionally feeble medially or absent. Absence of the gular fold occurred in specimens from across the range of the race (except on the Hamersley Plateau) but occurred more frequently in specimens from the Pilbara coastal plain. Development of the fold also appears to be independent of robustness.

The vertebral stripe (usually distinct and grey) is occasionally buff brown, faint or obscure, or divided medially. The ventral stripes had faded in many specimens but their number (4 or 5) on the gular area appeared to be independent of locality.

Some variation may have resulted from preservation. For example the gular area, or the whole ventral surface of some specimens, had a satin-like sheen and a few had dark dorso-lateral stripes instead of the usual pale stripes.

One specimen (WAM R30433) from 16 km S of Port Hedland combined characteristics of the two races; the gular area had three bold stripes as in the eastern race but two pre-anal pores were present.

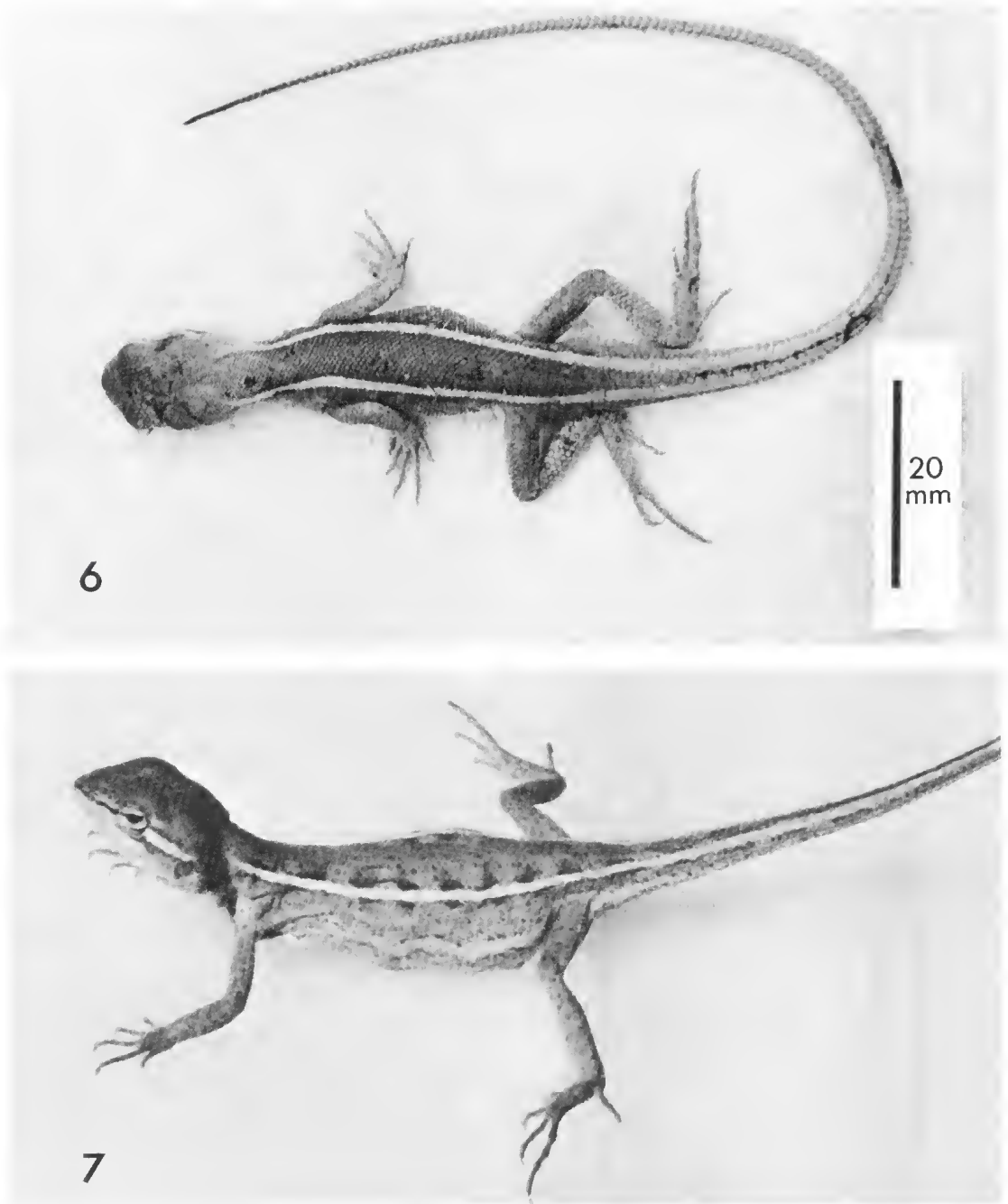
Although I have no personal observations of the habitat of this race, notes accompanying many specimens reveal that they were caught amongst porcupine grass (*Triodia* spp.) on sand dunes and sandy flats.

Specimens examined

The material listed by Storr (1974) from the collections of SAM and WAM plus the additional specimens listed below.

Typical eastern race: Northern Territory: Charlotte Waters, AM 2143-5. South Australia: 44 km WSW of Anna Creek HS, SAM R14522A-E; 7.5 km ENE of Bopeechee Rail Siding, SAM R13947A-C; Hunt Peninsula, Lake Eyre North, SAM R14643; shore of Lake Eyre, Muloorina Stn, SAM R14796; 22 km WNW of Moralana HS, SAM R14529; 5.5 km WNW of Myrtle Springs

Figs 2-5. Patterning in *Diporiphora winneckeii* (in life, the areas shown in solid black are either grey or yellow). 2, ventral pattern of typical eastern race; 3, dorsal head pattern of same; 4, 5, two variations of ventral pattern in western race.



Figs 6-7. *Diporiphora linga*: 6, adult male (black speckling on body is an artefact); 7, adult female in life.

HS, SAM R14532; 10 km ENE of Stuart Creek HS, SAM R14530 A-E.

Western race: Northern Territory: 62 km W of Ayers Rock, AEG 311, 342; 62 and 82 km NW of Chilla Well, AEG 203, 235; 13 km W of Mt Olga, AM 49711; Palm Valley, SAM R5047; 1.6 km W of Refridgerator Bore, SAM R11168. Western Australia: Marandoo, Mt Bruce, WAM R52703, R52737-8; 59 km N of Neale Junction, AEG 456; Nita Downs Stn, WAM R51996, R52009, R52011; Well 38, Canning Stock Route, WAM R44196.

Specimens excluded from D. winnekei

Amongst the specimens which Storr (1974) listed under *winnekei* were several from the Kimberley Division of W.A. and from Joanna Spring. The localities of these specimens lie above broken line B in Fig. 1. Having examined these and additional specimens from nearby localities I feel that they are more likely to represent an isolate of *D. bilineata* Gray than of *winnekei*. They differ from *winnekei* as follows: gular fold consistently absent; gular scales mucronate; gular area with 5 or 6 dark longitudinal stripes and chest and belly with 4 dark longitudinal stripes (faint or absent in many specimens); a dusky grey or black area above insertion of fore limb; dorsal pattern, especially dark cross bars, strongly developed in some individuals, virtually absent in others.

Typical and western *winnekei* occasionally lack the gular fold but never exhibit blackish patches above the fore limbs. However, such patches are characteristic of other species (e.g. *lalliae* and *bennettii*).

The specimens of this unplaced form which I have examined are the following (all in WAM unless indicated otherwise): Beagle Bay Mission, R46463; 81 miles (130 km) E of Broome, R36336; Derby (and 'presumably Derby'), R20262-4, R20317-29, R26834, R46661; Indujan Creek, La Grange, R27638; Joanna Spring, SAM R1430 A-B, R14621; La Grange, R46216; Point Coulomb, R40266.

Diporiphora linga n. sp.

FIGS 6, 7

Holotype: ♂, SAM R15020F, 23 km N of Koonibba Mission, S. Aust., 31°42'S, 133°26'E, 11-13.xi.1975, collected amongst tussocks of *Triodia* by C. & T. Houston, A. Edwards and J. Herridge.

Diagnosis: Morphologically and chromatically much like *D. winnekei* differing as follows. Males always and females usually with pre-anal

pores (absent in typical *winnekei*); back without a greyish vertebral stripe and its dark cross bands reduced to irregular spots along dorso-lateral stripes or virtually absent; ventral surfaces never longitudinally striped, white to pale grey often with weak ocelli on belly and base of tail; males with bright pink flanks and rump during spring (no similar coloration recorded in *winnekei*); form more robust than typical *winnekei* with thicker neck and fatter body; tail, on average, relatively slightly shorter (c.f. 227% to 253% of SVL). Also very like *D. reginae* but of smaller size and not quite as robust, lacking femoral pores, dorsal scales more weakly keeled and not mucronate, belly usually ocellate and pink wash of spring males extending along full length of flanks, not just on sides of tail base.

Description

Small dragon lizards reaching a maximum snout-vent length (SVL) of 51 mm in males and 61 mm in females; maximum total length 195 mm; form slender (Figs 6, 7).

Relative dimensions (expressed as %). Head length: SVL, 25-37 (mean 30, n = 49); hind limb length: SVL, 58-86 (mean 73, n = 47); tail length: SVL, 165-271 (mean 227, n = 47); head width: head length (measured from tip of snout to angle of jaw), 58-89 (mean 68, n = 48).

Dimensions of holotype (in mm): SVL, 48; head length, 16; head width, 10; tail length, 106; hind limb length, 36.

No nuchal or dorsal crests, nor post-auricular folds or spines but gular and scapular folds well-developed; dorsal scales longitudinally keeled but not mucronate; scales of back homogeneous, the keel lines more or less parallel or weakly converging posteriorly; scales of flanks weakly keeled to almost smooth, the keel lines nearer forelimbs converging with dorso-lateral stripes but parallel to them further back; chin and gular scales virtually smooth; chest and belly scales weakly longitudinally keeled and apically mucronate; 23-30 (mean 26, n = 48) subdigital lamellae on 4th toe; usually 2 pairs of pre-anal pores, occasionally 1 or 3 pairs, rarely absent; no femoral pores.

Coloration of female: Dorsal ground colour pale buff, greyish brown or olive brown; head patternless dorsally; a whitish stripe from eye to top of ear margined above and below with dark brown; a narrow dark brown line from eye extending forwards to snout through

nostril; upper and lower lips whitish; no vertebral stripe; a pair of narrow white or yellow dorsolateral stripes extending along back from nape, converging on base of tail and continuing for $1/3$ to $1/2$ its length before merging into ground coloration; usually 6-9 irregular dark brown spots along inner edge of each dorsolateral stripe on back, merging on base of tail to form a dark line separating the pale dorsolateral stripes; usually corresponding, but smaller spots on flanks below dorsolateral stripes; an irregular pale midlateral stripe often present; flanks speckled with dark brown and dappled with whitish spots; limbs uniform above or brown-speckled; gular area usually white; belly and lower half of tail base white to pale grey, commonly with dark-edged white flecks or distinct ocelli.

Coloration of male: Similar to that of female except that dark spots along dorsolateral stripes are reduced or obscure; in spring a diffuse bright pink wash extends from shoulders along flanks to sides of tail and onto region of rump and thighs, and dorsolateral stripes become rich yellow.

Habitat: The lizards inhabit *Triodia* hummocks in mallee *Eucalyptus* covered sand-dunes. They regularly bask in the crowns of the bushes and retreat into the dense growth if disturbed. Most specimens have been encountered on the slopes of dunes but a few were observed on hard sand flats between dunes.

Distribution: Throughout a belt of sandridge country extending from near Maralinga, through Ooldea, south-eastwards almost as far as Wirrulla and the Gawler Ranges on northern Eyre Peninsula, S.A. (Fig. 1).

Etymology: The specific epithet is a Pitjantjatjara aboriginal word meaning "little lizard" and is used as a noun in apposition.

Specimens examined (all localities in S.A.): Paratypes: 22 km E of Barton Rail Siding (30°34'S, 132°52'E), SAM R14978 A-I; Bates (19 km W of Barton), SAM R14855; 121 km N of Ceduna, SAM R14459 A-B; Immarna (or 407 miles, E-W line), AM 54626-7; 7 km W of Immarna Rail Siding (30°29'S, 132°05'E), SAM R14998 A-L; same data as holotype, SAM R15020 A-E, G, H; 6.7 km SW of turn-off to Lake Everard HS on Wirrulla-Kingoonya road, AEG 631; Maralinga bomb site, SAM R14447; S of Mt Finke (31°40'S, 133°58'E and 31°15'S, 134°00'E), SAM R15600-I; Watson (obviously in error), SAM R10822-6; 28-29 km NE of Wirrulla, SAM R15174, R15208 A-G, R15220; 23 miles (37 km) ENE of Wirrulla, WAM R24529-JO.

Discussion

The relative structural homogeneity of *Diporiphora* species requires that maximum use be made of colour patterning (including ventral patterning and transient sexual colours) for the purposes of their separation. However, because of the tendency of parts of the patterning to fade after preservation it is highly desirable that any further taxonomic studies of the genus be based on field studies of live specimens.

While my studies of preserved material could find no basis for separation of western *winneckeii* into two or more races, more specimens are required, especially from the Hamersley Plateau, to provide a clearer picture of variation. More material is also required from the central southern region of N.T. to show how closely the ranges of the eastern and western races approach each other.

Several species of *Diporiphora* are now known to be closely associated with hummock grasses: *reginae*, *lalliae*, *linga* and western *winneckeii* with *Triodia* and typical *winneckeii* with *Zygochloa*. This pronounced habitat specificity has doubtlessly played a major role in evolution of the species. Populations of *linga* are isolated from those of other hummock-dwelling species by extensive tracts of unsuitable habitat. In the west is the Nullarbor Plain and across the north are vast areas of mulga/tussock grass and chenopod shrub habitats. The ventral patterning differences between the two races of *winneckeii* are probably related to differences in the plants inhabited. The ventral striping probably serves to camouflage the lizards while they are perched amongst the straight leaves or stems of the grasses and fewer bolder stripes in the eastern race would suite the coarser more open growth of *Zygochloa* whereas more numerous narrower stripes in the western race would suit the finer denser growth of *Triodia*.

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